



LW155

7th International Artillery & Indirect Fire Symposium & Exhibition

Mr. Jim Shields
DPM, LW155

18-20 June 2002





LW155 System XM777 and TAD



The Future of Towed Cannon Artillery

XM777 Howitzer



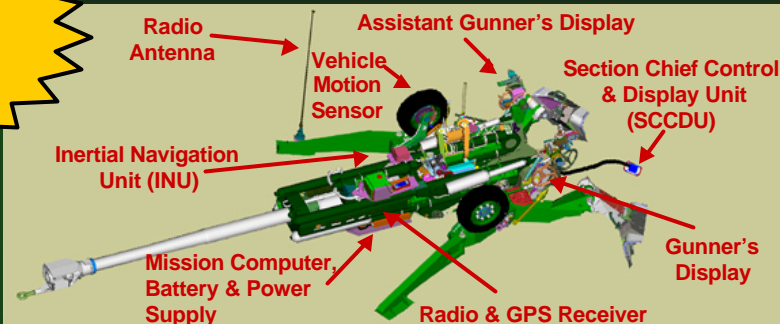
**Harder to Find,
Harder to Hit,
Harder to Kill!!**

- Improved Accuracy
- More Responsive

- Lightweight High-Strength Titanium
- Improved Strategic Deployment
- Improved Ground Mobility
- Improved Survivability

Towed Artillery Digitization (TAD)

- Dispersed – Flexible Operations
- No Survey





Joint Requirements for XM777 & TAD



The Future of Towed Cannon Artillery

XM777

- 10,000 Lbs. or Less - Deployable and Mobile*
- Emplace in 3 Min*
- Displace in 2 Min*
- All USAF (2 per C130, LW155 & FMTV in C141)
- Rate of Fire 4-8 RPM, Sustained 2 RPM
- Max Range 30km with Rocket Assist
- Bold Shift in 3 Min
- Primer Feed Mechanism
- 800 to 900 Rds Between Systems Abort
- Key Performance Parameters

Towed Artillery Digitization (TAD)

- Digital Indirect Fire Control
- Inertial Navigation with GPS Backup
- 1-Mil Pointing Accuracy
- Advanced Direct Fire Sight
- TAD Weight: 200-500 Pounds





Allied Involvement in LW155



The Future of Towed Cannon Artillery



- Italy and United Kingdom
- Trilateral EMD MOU, March 99
- Both Provided Supplemental Funding
- Production MOU Under Negotiation



Program Evolution

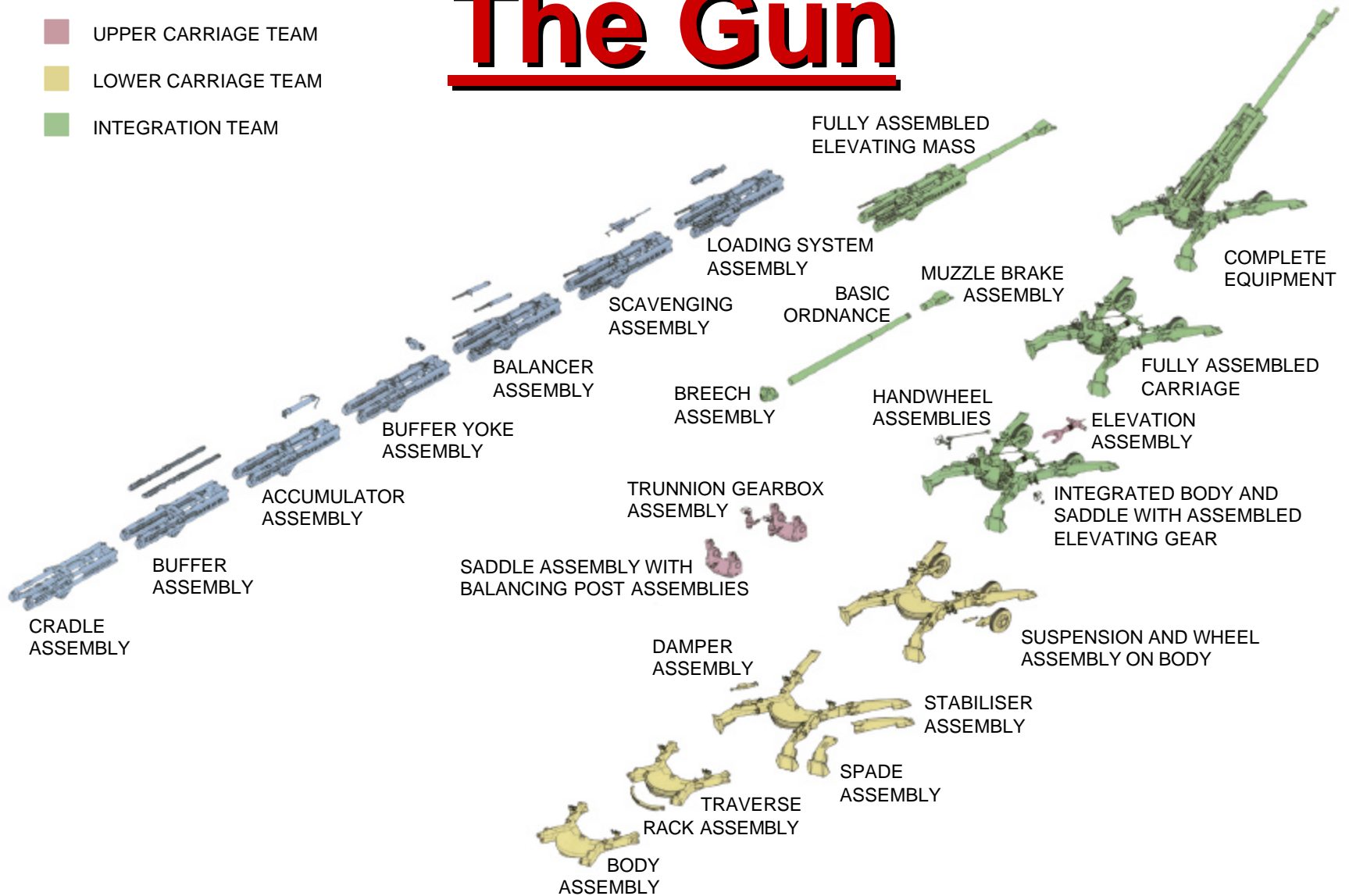


The Future of Towed Cannon Artillery



The Gun

- ELEVATING MASS TEAM
- UPPER CARRIAGE TEAM
- LOWER CARRIAGE TEAM
- INTEGRATION TEAM



GENERAL DYNAMICS
Strength on Your Side™

Digital Fire Control
Burlington, VT

HYDRO-MILL CO.
A TRIUMPH GROUP COMPANY

Body Assembly
Hydro-Mill
Chatsworth, CA



Cannon Assembly
Watervliet Arsenal
Watervliet, NY

 **RTI**
**International
Metals, Inc.**

Titanium
Niles, OH

 **oto melara**

Buffers, Balancers &
Accumulator
Oto Melara, Italy

BAE SYSTEMS

Prime Contractor & Developer,
Elevating Mass & Cradle Assembly
Barrow-in-Furness, England



OFC
St Louis, MO



Breech Operating &
Loading Tray System
Rock Island Arsenal
Rock Island, IL



Elevating Gear
Wegmann USA
Lynchburg, VA

XM777 LW155



Program Management
JPMO LW155
Picatinny Arsenal, NJ

 **Major**
Tool & Machine, Inc.

Spades & Stabilizers
Indianapolis, IN

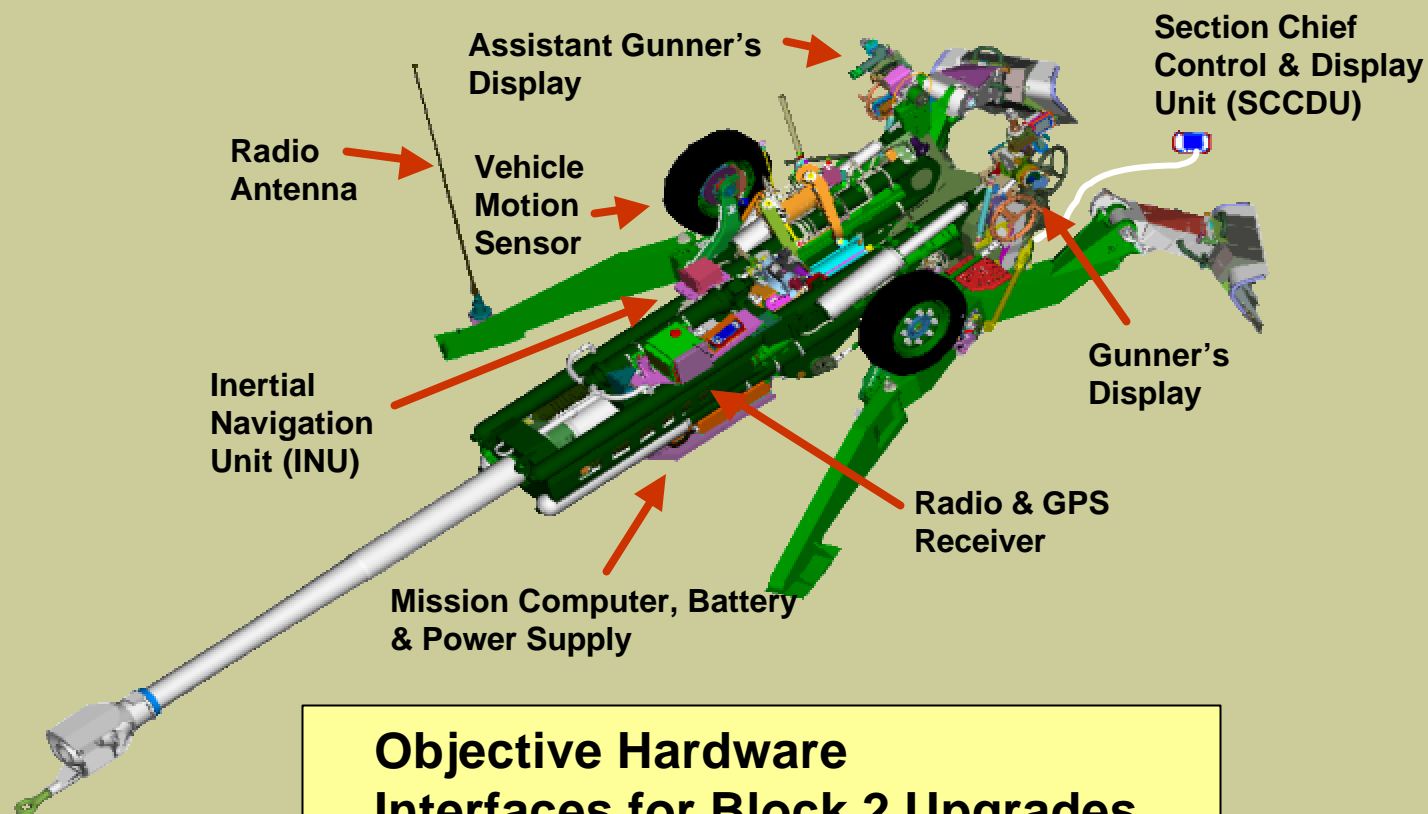


Technical Solution

XM777E1 Block 1 Components



The Future of Towed Cannon Artillery



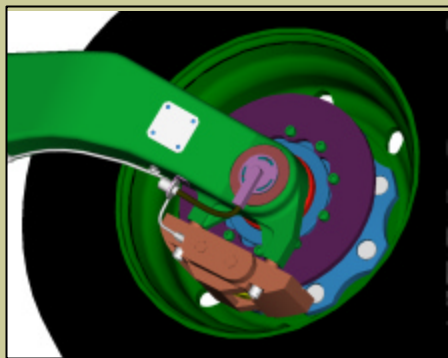
**Objective Hardware
Interfaces for Block 2 Upgrades**



TAD/XM777 Integration Status

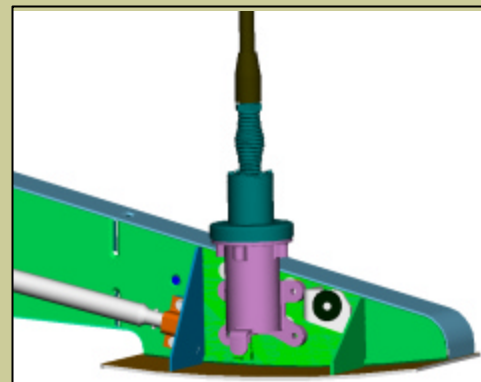


The Future of Towed Cannon Artillery



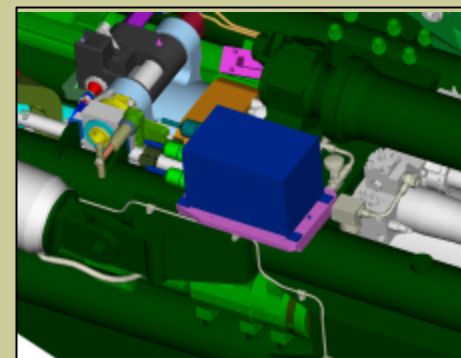
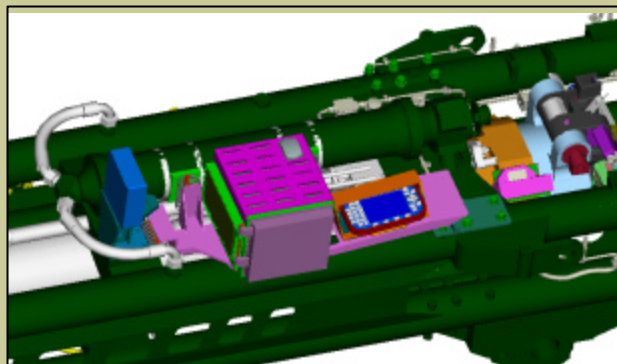
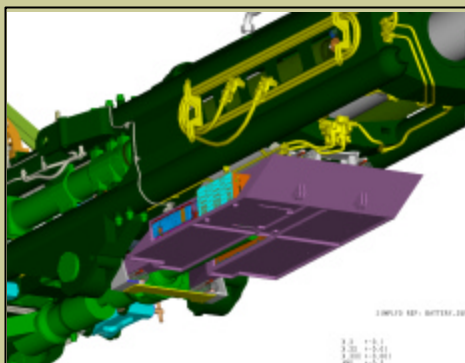
Axel Mods

- TALIN 4000 Selected as INU
- Mounting Locations On Gun 1008
- Incorporating Excalibur Platform Integration Kit (PIK) Interface
- Successful PDR Held Apr 9th



Stabilizer Mods

Cradle Modifications

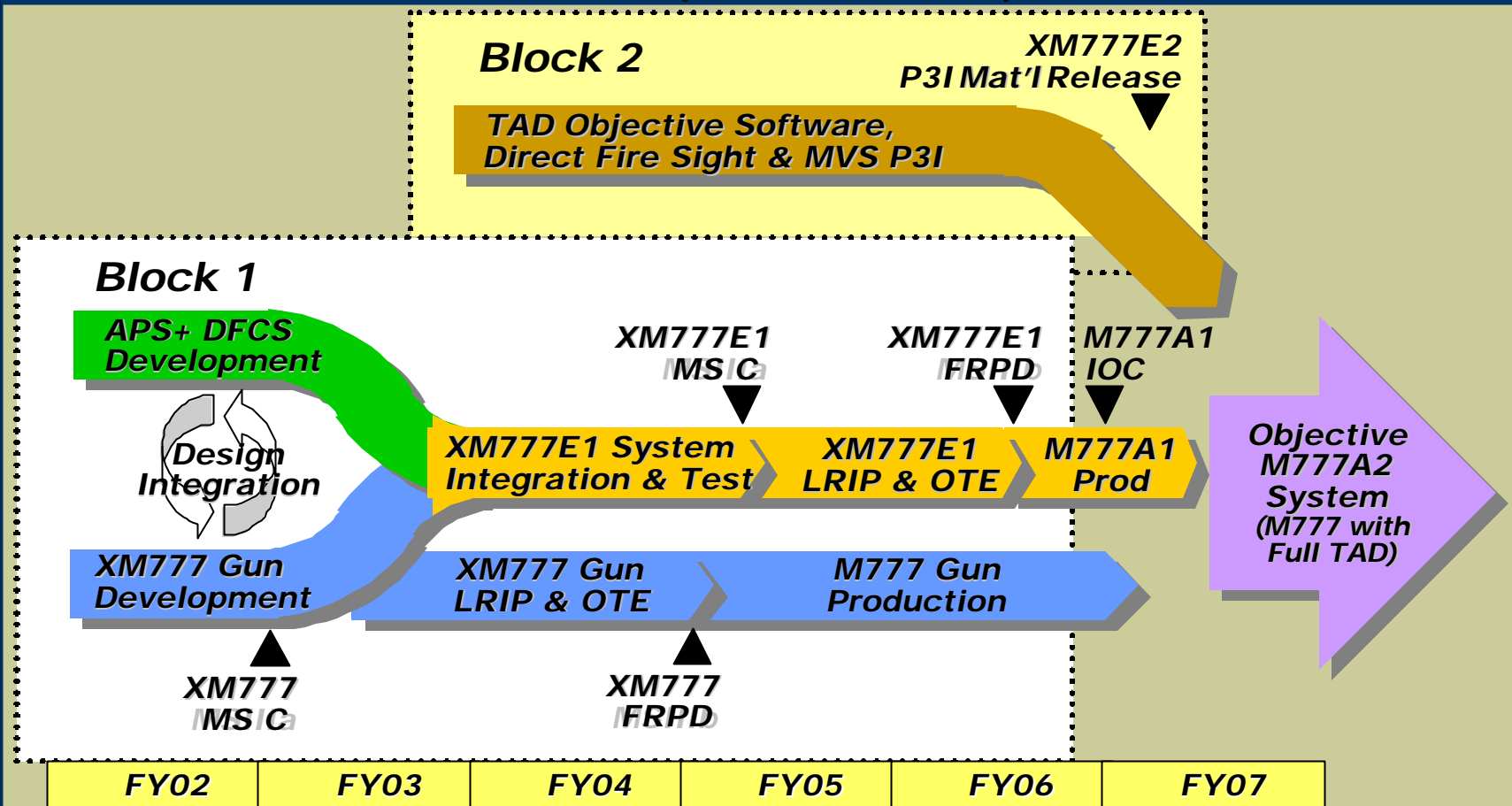




XM777E1 Schedule



The Future of Towed Cannon Artillery





Development Focus



The Future of Towed Cannon Artillery

- Applied Shoot-Off Lessons Learned
- Maximize Safety, RAM and HFE
- Comprehensive Evaluation of EMD Prototypes
- Logistics & Fielding Plans
- Joint Live Fire Tests
- Production Preparation



> 8000 Round Fired in DT
> 8000 Miles Towed in DT



Development Status



The Future of Towed Cannon Artillery

✓ Completed

Gun 1001 (Yuma Proving Ground)

- ✓ HFE Validation
- ✓ Firing Tables
- ✓ Initial TAD Component Firings
 - Strategic Lift
- ✓ Helo Lift
- ✓ Artic Evaluation (Ft Greely,AL)



Guns 1003 & 1005 (Yuma Proving Ground)

- ✓ Firing Tests
 - Extreme Temperature
 - NBC Decon. (Dugway,UT)
- ✓ Manned Rate of Fire
- ✓ Accuracy
- ✓ Safety Release Testing



Gun 1002 (Aberdeen Proving Ground)

- ✓ Automotive Certification Testing
- ✓ Rail Impact
 - Corrosion Test



Gun 1004 (Twenty-Nine Palms)

- ✓ Logistics Demonstration
 - ✓ Verify Manuals
 - ✓ Operator
 - ✓ Maintenance
- ✓ Verify Training Materials





Development Status (Continued)



The Future of Towed Cannon Artillery

✓ Completed

Gun 1005 - 1007

- ✓ @ 29 Palms for OA
- ✓ @ Pendleton for Amphib Ops
- ✓ @ San Diego for Ship Transport

Gun 1008

- ✓ Delivered to GDAS
- ✓ TAD Integration Asset

Pilot Production Gun 1

- ✓ Incorporates Castings
- ✓ Verify Manufacture Processes
 - Begin Test Aug 02 for MS C
 - Reliability Growth

Pilot Production Gun 2

- December 02 Delivery
- TAD Asset
- Bridge to LRIP





Operational Assessment



The Future of Towed Cannon Artillery



Three 96 Hour Scenarios Conducted with Two Weapons @ 29 Palms, CA

- Day/Night Operations
- > 5000 Rounds Fired
- > 1000 Miles Towed
- 1st and 2nd Echelon Maintenance Tasks
- Two Crews Each from both USMC and Army
 - ◆ VXIII ACA
 - ◆ 11th Marines
- Two Prime Movers
 - ◆ FMTV
 - ◆ MTRV

**OA Completed On Schedule
Independent Evaluation Ongoing**



Amphibious Operations @ Camp Pendleton, CA (10-14 June)



Shipboard Compatibility @ San Diego, CA (18-20 June)

- Lane Changing
- Rail Impact
- Direct Fire
- Accuracy

- Alaska Testing
- Rate of Fire
- Rock Ledge Course
- Fire Mission

Test Video





JPM LW155



Production Readiness



The Future of Towed Cannon Artillery

- 8 EMD guns manufactured using manual TIG
 - 3200 lbs of titanium per gun
 - 6000 welding hours per gun
 - Early distortion issues

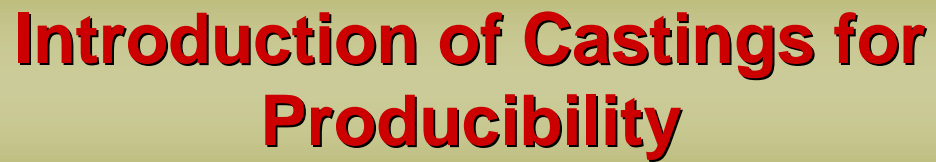
- 23 Castings introduced for gun 1009 (PP1)
 - Reduces welding hours by ~ 50%
 - Reduces Ti structures part count by 51%
 - Reduces manufacturing variability
 - Allows for 'targeted' strengthening of structures

- New Jigs and Process Controls
 - Corrected distortion and variability of fabrications

EMD



Production

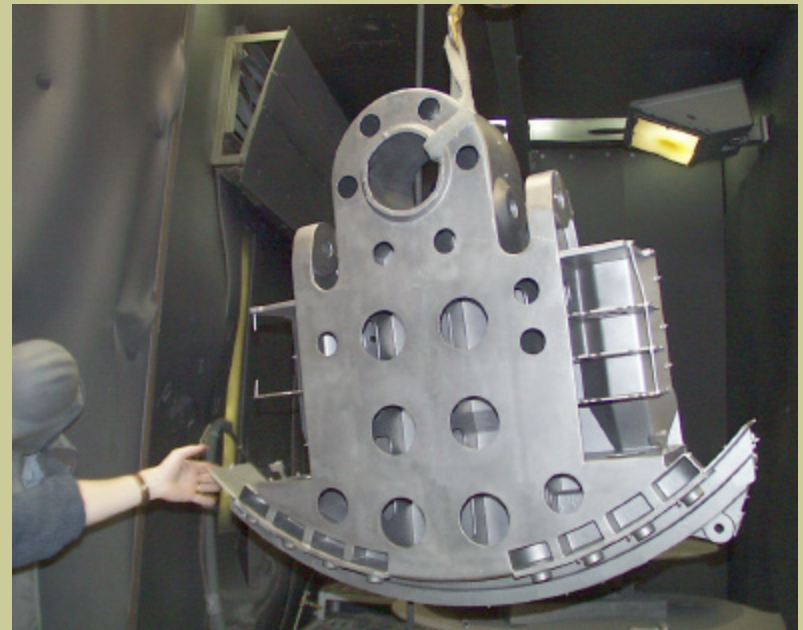




Saddle Base Fabrication



The Future of Towed Cannon Artillery



- 75 Pre -Prepared Component Parts
- 416 Man-hours
- Complex Fixturing Required
- Complex Purging
- Skilled Fabrication Resource
- High Risk Of Re-Work, Due To Shrinkage & Distortion Problems

**All Eliminated
by One Casting**

Summary

- Completed All Safety Testing
- Completed Operational Assessment - No Major Issues
- Production Planning Readiness on Track
- Pilot Production Gun 1 Roll-Out on 18 July
- TAD Interfaces Already on Weapon
- TAD Development Progressing

**Program on Track for Production
Decision Later this Year**